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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/531,207

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Tetsuhiro Ishikawa

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EXAMINER

BOBISH, CHRISTOPHER S

ART UNIT

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3746

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/531,207	<b>Applicant(s)</b> ISHIKAWA ET AL.	
	<b>Examiner</b> CHRISTOPHER BOBISH	<b>Art Unit</b> 3746	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 1-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/15/2005, 08/28/2006, 12/15/2006</u> .                      | 6) <input type="checkbox"/> Other: _____                          |



## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Lines 5-6 recite “having no sensor that detects at least a rotational position of the motor”, this language is redundant when compared to the previously recited “sensorless motor” and seems unnecessary. Furthermore it is not clear whether the motor is supposed to be able to detect a rotational position without a sensor.

Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim states that the system will restart when an abnormality is detected; until a point where it is determined that an abnormality is present. Examiner is confused as to how an abnormality could be detected if it is not always determined to be present in the system. That is to say, if an abnormality is determined to not be present, then how was it ever detected?

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 15, 17, 25, 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Takabayashi (US Patent No. 4,741,978).

limitations from claim 15, a hydrogen operated power system, comprising: a supply system which supplies a gaseous fuel from a fuel supply tank, **C. 2 Lines 31-34**, to a hydrogen operated power source, **FIG. 2 (1) C. 2 Line 27**; and a pump, **FIG. 2 (5) C. 2 Line 34**, provided in the supply system, which is driven by a sensorless motor, **FIG. 2 (6) C. 2 Line 36**;

limitations from claim 17, an abnormality detecting portion, **FIG. 1 (24, 25, 26) C. 3 Lines 20-46**, which detects a plurality of types of different abnormalities related to driving the motor; and an abnormality determining portion, **FIG. 1 (21) C. 3 Lines 18-28**, which determines that an abnormality has occurred in the supply system when an abnormality has been detected a predetermined number of times by the abnormality detecting portion **(24, 25, 26)** after an instruction has been given to start the motor until a predetermined period of time has passed, **C. 4 Lines 17-38**;

limitations from claim 25, wherein the abnormality detecting portion detects, as one of the plurality of abnormalities, at least one of an over-current abnormality in the motor, a short-circuit current abnormality in an element in the motor, and a lock abnormality in the motor, **C. 3 Lines 39-49**;

limitations from claim 26, wherein the hydrogen operated power source **(1)** is a fuel cell, **C. 2 Line 26**;

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15-18, 20, 21, 23, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nonobe et al (USPGPUB No. 2002/0094467 A1).

Nonobe teaches:

limitations from claim 15, a hydrogen operated power system, comprising: a supply system which supplies a gaseous fuel from a fuel supply tank, **FIG. 4 (300) ¶ 80**, to a hydrogen operated power source, **FIG. 4 (100) ¶ 26 and 75**; and a pump, **FIG. 4 (410) ¶ 26**; **Nonobe does not explicitly teach that a motor is present to drive the pump (410), however it would be obvious to one having ordinary skill in the art that a motor would be necessary in some manner in order to operate the pump as is known in the art;**

limitations from claim 16, wherein a supply system circulates the gaseous fuel supplied from the fuel supply tank **(300)** to the hydrogen operated power source **(100)** via a circulation path, **FIG. 4 (401, 403) ¶ 80**, so as to supply the gaseous fuel to the hydrogen operated power source, and the pump **(410)** circulates the gaseous fuel in the circulation path, **¶ 85**;

limitations from claim 17, further comprising: an abnormality detecting portion which detects a plurality of types of different abnormalities related to driving the motor; and an abnormality determining portion which determines that an abnormality has occurred in the supply system when an abnormality, regardless of type, has been detected a predetermined number of times by the abnormality detecting portion after an instruction has been given to start the motor until a predetermined period of time has passed, **¶ 72-73**;

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limitations from claim 18, wherein a supply system is provided with a check valve, **FIG. 4 (426) ¶ 80**, mounted on a discharge side of the pump **(410)**, and the abnormality determining portion determines sticking of the check valve to be an abnormality in the supply system, **¶ 72 discusses the failure of a valve (404) to be a detectable abnormality in the system, and while this is not the check valve immediately at the discharge side of the pump, examiner believes that the malfunction of the check valve (426) would cause similar pressure changes and it would have been obvious to one having ordinary skill in the art to monitor this valve for failure as well or in place of the other valve (404);**

limitations from claim 20, further comprising a pressure detecting portion which detects a pressure on the discharge side of the pump, and the abnormality determining portion determines whether the check valve is stuck based on the pressure detected by the pressure detecting portion, **the upper half of ¶ 72 teaches a valve failure leading to a detectable pressure change in the system;**

limitations from claim 21, further comprising a system stopping portion which stops the system when it has been determined by the abnormality determining portion that there is an abnormality in the check valve, **¶ 72-73;**

limitations from claim 23, further comprising: an abnormality detecting portion which detects a plurality of types of different abnormalities related to driving of the motor; and a system stopping portion which stops the system when an abnormality, regardless of type, has been detected a predetermined number of times within a predetermined period of time by the abnormality detecting portion, **¶ 72-73;**

limitations from claim 26, wherein the hydrogen operated power source is a fuel cell, **FIG. 4 (100) ¶ 77;**

limitations from claim 27, wherein the hydrogen operated power system is a hydrogen engine, **¶ 3 - ¶ 5.**

Claims 19, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nonobe et al (USPGPUB No. 2002/0094467 A1) as applied to claims 15, 17 and 18 above, and in further view of Ferguson et al (US Patent No 6,463,949 B2).

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Nonobe teaches and discloses of the power system of claims 17 and 18.

Ferguson further teaches:

limitations from claims 20 and 21, a method of detecting valve failure based on system pressure, and shutting the system down when an abnormality occurs, **C. 5 Lines 11-23;**

**It would have been obvious to one having ordinary skill in the art of pumps/valves at the time of the invention to combine the method of detecting abnormalities in valves as taught by Ferguson with the power system of Nonobe in order to protect the system from damage C. 1 Lines 18-23;**

limitations from claim 19, further comprising an outside air temperature detecting portion which detects an outside air temperature, and the abnormality determining portion determines whether the check valve is stuck based on the outside air temperature detected by the outside air temperature detecting portion, **C. 1 Lines 18-23 of Ferguson teach that temperature of a fluid can be monitored in order to detect an abnormality in a valve, it would have been obvious to one having ordinary skill in the art of fuel pump systems to monitor the temperature outside of the system alternatively, as is known in the art of fuel systems, to monitor a valve;**

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nonobe et al (USPGPUB No. 2002/0094467 A1) in view of Ferguson et al (US Patent No 6,463,949 B2) as applied to claims 15, 17, 18, 20 and 21 above, and in further view of Sugawara et al (US Patent No 7,279,242 B2).

Nonobe and Ferguson teach and disclose of the pump of claims 15, 17 and 18.

Nonobe does not teach monitoring an outside air temperature, Ferguson teaches monitoring a temperature of fluid inside the system, to check a valve status.

Sugawara teaches a section to monitor an outside air temperature of a system to control a valve.



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limitations from claim 19, further comprising an outside air temperature detecting portion which detects an outside air temperature, **C. 6 Lines 52-63**;

**It would have been obvious to one having ordinary skill in the art of pump/valve systems at the time of the invention to combine the temperature sensing system of Sugawara with the power system taught by Nonobe and modified by Ferguson in order to prevent system damage by running a pump/motor while an abnormality in the system exists. Furthermore, one of ordinary skill in the art would be able to conclude from Sugawara that an abnormal change in temperature measured would be related to the function of a valve.**

Claims 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nonobe et al (USPGPUB No. 2002/0094467 A1) as applied to claims 15, 17, 18 and 23 above, and in further view of Clack et al (US Patent No. 6,017,192).

Nonobe teaches and discloses of the power system of claims 15, 17, 18 and 23.

Nonobe does not teach a restart instructing portion, but Clack does.

Clack teaches:

limitations from claims 22 and 24, a restart instructing portion instructing a system to restart when an abnormality has been detected, and stopping the system when the restart portion determines there is an abnormality, **C. 11 Lines 36-54 and C. 12 Lines 44-67**;

**While Clack teaches a method of controlling a refrigeration system rather than a fuel system, both are fluid moving circuits and it would have been obvious to one having ordinary skill in the art of pumps/motors at the time of the invention to provide the system taught by Nonobe with the monitoring system taught by Clack in order to protect the system from damage due to prolonged running with undetected failures.**

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER BOBISH whose telephone number is (571)270-5289. The examiner can normally be reached on Monday through Thursday, 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571)272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Bobish/  
Examiner, Art Unit 3746

/Devon C Kramer/  
Supervisory Patent Examiner, Art  
Unit 3746

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/C. B./  
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